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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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January 25, 2002

TO: Internal File

FROM: Jim D. Smith, Senior Reclamation Specialist/Team Lead JDS

RE: Mill Fork Lease Extension of the Deer Creek Mine, Energy West Mining, PacifiCorp, Deer Creek Mine, C/015/018-PM01I

SUMMARY

The Mill Fork Lease (Utah State Lease ML-48258) adds approximately 5, 563 acres to the Deer Creek Mine permit area, bringing total acreage to approximately 24, 500 acres. Energy West acquired the lease on April 12, 1999. The permit application package (PAP) to add the Mill Fork Lease to the Deer Creek permit was received by the Division on October 10, 2001.

Entry from the existing permit area will be by entries in the Hiawatha Seam, advanced from the current permit area by way of Lease Modification #3, a 65.7-acre area that has been added to Lease U-06039 for this purpose. The only potential surface facility associated with this permit extension is the possible ventilation breakout in Crandall Canyon, upstream of the existing Crandall Canyon Mine. The need for these portals will be evaluated and the design will be made based on future coal exploration. If these portals are needed, they will be permitted in a separate application. All currently planned coal mine operations in the Mill Fork Lease will be underground.

Coal will be mined in both the Blind Canyon and Hiawatha Seams, with access to the Blind Canyon, which is to be mined first, through rock slopes within the Mill Fork Lease area. Total cumulative extraction from both seams will not exceed 20 feet. The full extraction methods to be used are anticipated to cause subsidence that can be planned and controlled.

In lieu of submitting adequate and complete baseline water-quantity and –quality data, the PAP refers to data in Annual Reports and other sources for the required information. The Coal Mining Rules are clear that the PAP should be complete and contain the required information; otherwise, persons reading the PAP are forced to search out information at other sources to understand the Mill Fork Lease PAP.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The application for the proposed Mill Fork Lease area contains a description of the existing, pre-mining environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities.

Findings:

Environmental Resource Information in some sections of the Mill Fork Lease PAP and current Deer Creek Mine MRP is not adequate to meet the requirements of the Coal Mining Rules for approval of incorporation of the Mill Fork Lease Extension into the Deer Creek Mine MRP. Prior to approval the Applicant must provide information listed below in various sections of this Technical Memo.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The current MRP and Annual Reports provide statements of the climatological factors that are representative of the proposed permit area, including the average seasonal precipitation. The average direction and velocity of prevailing winds; and seasonal temperature ranges.

Surface water originates mainly from snowmelt, with a significant annual runoff season. Precipitation varies from year to year, with resulting variations in stream flows and spring discharges **(R645-301-624).**

As determined by the Division, additional data has not been deemed necessary to ensure compliance with other regulatory requirements.

Findings:

Climatalogical Resource Information in the current Deer Creek Mine MRP provides information that is adequate to meet the requirements of the Coal Mining Rules for the Mill Fork Lease.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Appendix A of the Mill Fork Lease Extension to the Deer Creek Mine PAP is an update of the monitoring plan in Volume 9 of the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg PAP. Appendix B is a report by Mayo and Associates, "Surface-water and ground-water investigation of the Mill Fork Lease area, Emery County, Utah ", for the Mill Fork Lease, which includes a PHC determination.

Appendix C to the Mill Fork Lease Extension to the Deer Creek Mine PAP has been submitted with information on springs and seeps in the Mill Fork Lease. There is an interesting section with photos and descriptions of the sites; details on location and elevation, geology and stratigraphic position, and water rights and development information; relationships to other springs; and a determination of the probable recharge area. This appendix also contains data report sheets for select seeps and springs – including isotope data for select springs, and water rights in the Mill Fork Lease area.

Jointing, which affects hydrologic characteristics, is significant in the rocks of the Mill Fork Lease area. The dominant joints in the area parallel the Joes valley fault, trending predominantly north-south to north 10^0 east, and a few secondary fracture sets follow other orientations (R845-301-624). Geology is described in R645-301-600-Geology of the Mill Fork Lease PAP, and because geology relates to ground and surface water, it is further discussed in R645-310-700-Hydrology.

Sampling and Analysis

Water-quality sampling and analyses of samples will be done according to the "Standard Methods for the Examination of Water and Wastewater". Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP Volume 9, Appendix A has sample documentation and analytical methods and detection limits (R645-301-723, p. 7-69).

Baseline Information

Ground-water information is found in R645-301-721, subsection A, and surface-water information is in R645-301-721, subsection B.

Ground-water Information

The Coal Mining Rules are clear that the PAP should be complete and contain the required information; otherwise, persons reading the PAP are forced to search out information at other sources to understand the Mill Fork Lease PAP.

The Mill Fork Lease PAP does not contain depths to the water in the coal seams, and each water-bearing stratum above and potentially impacted stratum below the coal seams. Although some consider the Blackhawk and Star Point strata to be a regional aquifer, water intercepted in the mine workings is usually encountered in perched aquifers, tabular or stream channel sandstones that have moderate porosity but low permeability and poor interconnectivity. Water is also encountered in open joint-systems in these rocks, and in some instances in fault zones (Roan Canyon fault zone) and synclines (Straight Canyon syncline) (R645-301-624, p. 6-18).

The location of known seeps and springs within the Mill Fork Lease area are shown on the Pre-Subsidence Survey Map (MFS1839D). Ground-water rights and users are described in some detail at R645-301-721, subsection A-15 – Groundwater Rights and Users (pp. 7-47 - 7-50). No wells are mentioned, and the Division has no knowledge of water wells or other ground-water resources in this area.

Laboratory reports for 42 seeps and springs from the 3rd and 4th quarter 2000, and for 50 seeps and springs from the 2nd and 3rd quarter 2001 in the Mill Fork Lease are in Volume 12 of the Mill Fork Lease PAP; **however, 4 samples from 2000 and 1 from 2001 are surface-water samples: this needs to be clarified**. Reports covering field parameters go back to 1982 for a few springs. Water-rights and a summary of historic water-quality data for the area are also in Volume 12.

Energy West collects operational water-monitoring data at high flow (May or June) and low flow (August, September, or October). Baseline data collection has followed the same schedule. Baseline data in the PAP for the 17 springs that are to be added to the operational monitoring are summarized in Table 1 below: EM-216, RR-5, and MF-19B have had only field parameters measured during this baseline period, and no proposed water-monitoring site has had water quality determined by lab analyses for more than 2 quarters. Six of these 17 springs have water rights. Data from seeps and springs that are not being proposed for operational monitoring are comparable. **Ground-water baseline data are not sufficient to establish seasonal quality and quantity of ground water. Data from 4th quarter 2001 need to be included in the PAP.**

Ten springs with water rights (Mill Fork Lease PAP Table MFHT-2) are not being proposed for monitoring, and eight of the springs with water rights have no baseline data (Table 2 below). Water rights indicate some person has an interest in the quality and quantity of the water and the potential of impacts to that spring from mining. **Clarify why these springs do not have baseline and why they will not be monitored.**

Data from 1980, 1981, 1982, 1991, 1992, 1993, 1994, 1995, and 1996 in the R645-301-700 Hydrology - Tables do not identify the date, the month, the quarter, or the season they were collected, who collected the data, or for what reason they were collected; they are not effective in determining seasonal variations of quality and quantity. Some of these data are briefly discussed on pages 22 and 23, but the connection between the R645-301-700 Hydrology - Tables and pre-lease hydrology evaluation for the USFS by Genwal is not clear. **Clarify the source of these data and Energy West's evaluation of the quality of these data.**

Table 1 – Baseline for Operational Monitoring Springs

Spring *Water Right*	1982	1993	1994	1995	1996	2000 3rd quarter	2000 4th quarter	2001 2nd quarter	2001 3rd quarter
EM-216 *93-3399*			field			field			
JV-9						field, lab		field, lab	
JV-34							field, lab	field, lab	
MF-7		field	field		field	field, lab		field, lab	
MF-10 *93-1412*		field	field	field	field		field, lab		field, lab
MF-19B *93-1413*			field	field	field	field			
MF-213 *93-259*	field					field, lab		field, lab	
MF-219 *93-1410*						field		field, lab	
MFR-10								field, lab	
MFR-30								field, lab	
RR-5			field		field	field			
RR-15			field	field	field		field, lab		field, lab

RR-23A				field	field		field, lab		field, lab
SP1-26							field, lab		field, lab
SP1-29									field, lab
UJV-101		field		field	field		field, lab		
UJV-206 *93-3400*					field	field, lab		field, lab	

Table 2 – Baseline Monitoring of Springs with Water Rights
(based on Mill Fork Lease PAP Table MFHT-2)

Spring (M=monitored) *Water Right*	1982	1993	1994	1995	1996	2000 3rd quarter	2000 4th quarter	2001 2nd quarter	2001 3rd quarter
EM-215 *93-1254*			field						
EM-216 (M) *93-3399*			field			field			
JV-26 *93-998*									
JV-36 *a23164*									
JV-43 *93-1572*									
MF-10 (M) *93-1412*		field	field	field	field		field, lab		field, lab
MF-19B (M) *93-1413*			field	field	field	field			
MF-213 (M) *93-259*	field					field, lab		field, lab	
MF-219 (M) *93-1410*						field		field, lab	
RR-14A *93-1414*			field	field	field				
UJV-204 *93-810*		field	field	field	field				
UJV-206 (M) *93-3400*			field	field	field	field, lab		field, lab	
UJV-207		field	field	field	field	field,		field,	

93-821						lab		lab	
UJV-209A *93-102*			field	field	field	field, lab		field, lab	
UJV-213 *a21560*									
UJV-214 *93-811*									

Water-quality descriptions include those parameters required by the Coal Mining Rules: total dissolved solids (TDS) and specific conductance corrected to 25 C, pH, total iron, and total manganese. In addition, baseline and operational parameters from DOGM directive Tech 005 have been determined for the samples submitted for laboratory analysis (and are included in Tables 1 and 2 of Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP Volume 9).

Monitoring parameters include approximate rates of discharge from the seeps and springs. Usage is given in the water-rights print-outs in Volume 12 of the Mill Fork Lease PAP, and locations of the water rights are shown on Drawing MFS1832D- Water Rights in Volume 12.

The Applicant states that extensive research has established that the surface- and ground-water systems are not hydraulically connected, so no impacts to surface waters is expected (R645-301-624, p. 6-18). Much of the information from this research is summarized in Appendix B of the Mill Fork Lease PAP, "Surface-water and ground-water investigation of the Mill Fork Lease area, Emery County, Utah", by Mayo and Associates.

Surface Water Information

Crandall Canyon, Rilda Canyon, Mill Fork, and Indian Creek are the main surface drainages in the Mill Fork Lease area. A number of unnamed tributaries to Indian Creek flow from the west side of East Mountain. Only Crandall is perennial. Crandall, Rilda, and Mill Fork are tributary to Huntington Creek, Indian Creek is tributary to Cottonwood Creek. Little Bear Canyon was excluded from the Mill Fork Lease to protect Little Bear Spring.

Crandall Creek has been monitored for a number of years by Genwall Resources. The Applicant will not monitor this stream unless Genwall terminates monitoring (p. 6-62).

Rilda Canyon has been monitored downstream of the Mill Fork Lease since 1989. Baseline quality analysis monitoring was done in 1989-1990, and is to be repeated every five years.

Data for Mill Fork have been submitted with Energy West's **quarterly reports** since 1997. Flows have been monitored monthly since January 1997, but most reports show no flow.

Water-quality reports for the three samples collected in 1997 and 1998 include information on total suspended solids, total dissolved solids or specific conductance corrected to 25° C, pH, total iron, and total manganese. Operational parameters from DOGM directive Tech 005 have been determined for the samples submitted for laboratory analysis during 1997 and 1998. According to the Mill Fork Lease PAP, baseline quality analysis was done from 4th quarter 1998 through 4th quarter 2000 (p. 7-63: it states on page 8 of the 2000 Annual Report that because there was no-flow in 2000, baseline monitoring was to be continued through 2001). Baseline analyses will be repeated every five years (p. 7-63). The 2000 **Annual Report** summarizes baseline data for 1999 and 2000, but this summary gives no information on seasonal variation of quality and quantity. **Most information referred to above was from sources other than the Mill Fork Lease PAP. Baseline data or data summaries for Mill Fork in the Mill Fork Lease PAP do not provide information on seasonal variation of quality and quantity and are incomplete and inadequate, so current baseline information as required by the Coal Mining Rules is not available in the PAP.**

Indian Creek was monitored for baseline parameters in 2000 and 2001. It states on page 7-67 that information from baseline sampling is included in Appendix C of the Mill Fork Lease PAP. There are data for October 2001 in the Mill Fork Lease PAP: data for the other seven quarters have not been included in the PAP. (There is no summary of Indian Creek data in the 2000 Annual Report.) **Baseline data or data summaries for Indian Creek in the Mill Fork Lease PAP do not provide information on seasonal variation of quality and quantity and are incomplete and inadequate, so current baseline information as required by the Coal Mining Rules is not available in the PAP.**

There are no known water-supply intakes for current users of surface waters flowing into, out of, and within the Mill Fork Lease hydrologic area. The water supply system in Rilda canyon is shown on maps and drawings in the existing Deer Creek Mine MRP. No surface waters will receive discharges from affected areas in the proposed Mill Fork Lease area. Locations for Deer Creek Mine UPDES discharge points are shown on maps in the existing MRP.

Names and locations of surface water bodies within the proposed Mill Fork Lease permit and adjacent areas are shown on several maps, including Plate 1; Drawing MFS1830D – Hydrologic Map; and Drawing MFS1839D - Pre-subsidence Survey Map. Water rights are listed in water-rights print-outs in Volume 12 of the Mill Fork Lease PAP, and locations are shown on Drawing MFS1832D - Water Rights in Volume 12. Surface-water bodies are described in R645-301-721, subsection B (pp. 7-54 – 7-71. No surface waters will receive discharges from affected areas in the proposed Mill Fork Lease area. Locations for Deer Creek Mine UPDES discharge points are shown on maps in the existing Deer Creek Mine MRP.

With the exception of Indian Creek Above (ICA), Indian Creek Below (ICB), Indian Creek Canal, and EM Pond, which are included with the seep and spring data, there does not appear to be any surface-water quality and quantity data in the Mill Fork Lease PAP. The

Applicant states that baseline data have been collected since 1997 at MFA01 and MFB02 in Mill Fork, and during 2000 and 2001 at ICA, ICB, Indian Creek Flume (ICF – installed by Genwall Resources), and Indian Creek Ditch (ICD – same as Indian Creek Canal?). Data are in the Annual Reports. Locations are shown on Drawing MFS1851D – Hydrologic Monitoring Map.

Information on the ICA, ICB, ICD, and EM Pond in the Mill Fork Lease PAP is not sufficient to demonstrate seasonal variation and water usage. Water-quality descriptions include baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25° C, pH, total iron, and total manganese. In addition, baseline and operational parameters from DOGM directive Tech 005 have been determined for the samples submitted for laboratory analysis (and are included in Tables 1 and 2 of Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP Volume 9).

There will be no new mine openings under the Mill Fork Lease PAP and no potential for acid drainage from the proposed mining operation in the Mill Fork Lease area. Nevertheless, the Applicant has included information on baseline acidity and alkalinity in the ground-water quality analyses.

Flow down many canyons is through the alluvium rather than at the surface, although water may surface for a short reach and then percolate into the alluvium again as it continues its flow down the canyon (p. 6-18).

Baseline Cumulative Impact area Information

No information has been submitted with the Mill Fork Lease PAP specifically for the Division to use in updating or modifying the East Mountain CHIA. Information on numerous springs that have not been monitored previously is included. The information will be useful in determining impacts within the CIA, but probable impacts to these springs will not cause material damage to the hydrologic balance outside the CIA.

The Mill Fork Lease is in the cumulative impact area (CIA) for the East Mountain CHIA prepared by the Division in 1994. Mining will be done beneath the Mill Fork, Rilda Canyon, and Indian Creek watersheds. The Mill Fork Lease area is between Joes Valley fault and the Mill Fork graben. The Joes Valley fault is especially important as it is a hydrologic barrier between the mine and Indian Creek in Joes Valley in the subsurface; shallow ground-water flows through alluvium in the bottoms of the canyons that descend from East Mountain to Joes Valley and then flows into Joes Valley through the alluvial fans that cross the fault (R645-301-624, p. 6-18).

Although the areas of impact will shift within the CIA, there should be no change to cumulative impacts outside the CIA. The main hydrologic impact will be removal of water from storage in the Blackhawk Formation and Star Point Sandstone, which will have no impact on the hydrologic balance outside the CIA. The quantity of discharges from the mine to surface waters should continue at rates similar to those from other recent mine operations, and water quality of

the discharges should also be similar, so surface water will not be further impacted or materially damaged.

Modeling

Modeling techniques have not been included as part of the Mill Fork Lease PAP.

Alternative Water Source Information

The Applicant commits to the replacement of water lost or adversely affected, prior to final bond release, as a result of mining operations in the Mill Fork Lease area. Water will be replaced from an alternate source in sufficient quantity to maintain the current and post-mining land uses (R645-301-731.800, p. 7-100). The source and suitability of the alternative water are not identified or discussed; however, the probable hydrologic consequences determination required by R645-301-728 does not indicate that mining in the proposed Mill Fork Lease may proximately result in contamination, diminution, or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial or other legitimate purpose. Therefore, the application is not required to contain specific information on water availability and alternative water sources.

Probable Hydrologic Consequences Determination

The planned subsidence from full-extraction mining should result in a generally uniform lowering of the surface over broad areas, and that will limit the extent of material damage to the surface lands, with no appreciable change to land uses and renewable resources, including seeps, springs, and streams. Experience in the Deer Creek Mine area shows that subsidence occurs within two months of coal extraction, and the land is stable after two years. Predicted subsidence is 0 -15 feet, based on total cumulative extraction not exceeding 20 feet.

Full-extraction mining will be done beneath the headwaters of Rilda, Mill Fork, and Crandall Canyons. There will be no full-extraction mining beneath and no subsidence of the stream channels in those canyons. The PAP discusses the PHC on pages 78 – 96 and in Appendix B of R645-301-700.

The permit application is to contain a determination of the PHC of the proposed coal mining and reclamation operation upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas. Complete and adequate seasonal baseline data, upon which the PHC is to be based, are not in the PAP. Nevertheless, the determination of the PHC on pages 123 – 130 of Appendix B includes findings - based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas - on:

1. *Whether adverse impacts may occur to the hydrologic balance;*
    a. Mining in the current Energy West permit areas has not affected surface-

and ground-water flows.

i. Most springs identified in the Deer Creek Mine and Mill Fork Lease areas occur in the Price River, North Horn, and Flagstaff formations;
   1. The layout of the past and future mines is designed to minimize subsidence impacts to the steep cliffs of the Castlegate Sandstone.
   2. Nearly all observed subsidence has occurred in the Price River, North Horn, and Flagstaff formations that overlie the Castlegate.
   3. Springs in the Price River, North Horn, and Flagstaff formations are isolated from subsidence related *fracturing* because of :
      a. the thickness of overburden; and
      b. clayey units that deform plastically and swell when wetted.
   4. Numerous springs have been undermined on East and Trail Mountains, and those that are on areas that have subsided show no evidence of discharge declines attributable to subsidence or fracturing.

ii. Ephemeral and intermittent reaches or Deer Creek and Grimes Wash have been subsided, with no discharge declines attributable to mining-induced subsidence.

iii. Waters encountered underground by mining are from strata immediately above and below the mined horizon and from faults.
   1. Water in strata above the coal are from isolated, inactive systems that are not in connection with the near-surface spring waters.
   2. Inflows into the Deer Creek and Crandall Canyon Mines have occurred from faults.
      a. In general, these waters do not appear to be tied to modern, active ground-water systems; however
      b. Tritium data indicate that some ground-water inflows from these faults are local and in hydraulic communication with modern near-surface water.
   3. In the Straight Canyon Syncline, substantial volumes of ground water have flowed into the Deer Creek Mine from the underlying Star Point Sandstone.

b. By analogy with currently mined areas:

i. Reduction of surface-water flows in Mill Fork, Crandall, and Rilda Canyons is not anticipated.

ii. The potential for adverse affects to headwater reaches of Mill Fork that overlie planned full-extraction mining areas is minimal

because these channel reaches are separated from the coal by the thick sequence of low-permeability North Horn and Price River Formations.

iii. The Mill Fork Lease area has no structure analogous to the Straight Canyon Syncline, so inflows to the mine from the underlying Star Point Sandstone are not anticipated.

iv. Mining within 200 to 300 feet of the Joes Valley fault system could intercept appreciable quantities of modern near-surface water.

c. The potential for adverse impacts to Little Bear Spring is small because:

i. It is 1.5 miles from the lease boundary and 2 miles from the nearest proposed mining; and

ii. It discharges from an active ground-water system that is in good communication with shallow recharge sources.

2. *Whether acid-forming or toxic-forming materials are present that could result in the contamination of surface- or ground-water supplies;*

a. Pyrite has been identified in the PacifCorp mines.

i. The pyrite oxidizes to produce acid.

ii. Acidic waters and iron have not been observed in the PacifiCorp mines.

1. Acid produced by pyrite oxidation is quickly neutralized by naturally occurring carbonate minerals.

2. Iron is precipitated as iron hydroxide.

b. No other acid-forming material than pyrite and no toxic-forming materials have been found or are suspected to exist in strata to be disturbed by mining.

c. Extensive testing of overburden strata, coal, and surrounding rocks has shown that there are no potentially acid- and toxic-forming materials (R645-301-623.100). Details of yearly analyses (1993 to 1999) of coal, floor, and roof are in R645-301-600-Geology - Appendix C of the Mill Fork Lease PAP. Analyses of overburden material are presented in Table G-1 in Volume 8 of the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP, and summarized in Appendix A of the Mill Fork Lease PAP.

3. *What impact the proposed coal mining and reclamation operation will have on:*

a. *sediment yield from the disturbed area;*

i. Sediment yield from disturbed surface areas is minimized by sediment control structures;

ii. Sediment in mine discharge water is minimized by sedimentation ponds;

iii. Subsidence can increase or decrease sediment load in streams;

1. Increased stream gradient;

a. Higher flow velocities;

b. Greater sediment entrainment.

c. Extent this will occur in the Mill Fork Lease area is not known, but this is typically local and short-lived.

2. Decreased stream gradient, stream impoundment;
   a. Sediment deposited in the impoundment;
   b. Extent this will occur in the Mill Fork Lease area is not known, but this is typically local and short-lived.

b. acidity, total suspended and dissolved solids and other important water quality parameters of local impact;

i. Most springs occur in strata above the coal seam and mine, so a mechanism for impact is unlikely.
ii. Past monitoring at the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg Mines has detected no impacts to quality of water in springs and streams.
iii. Water discharged from the Mill Fork Lease will be subject to UPDES standards.
iv. Water discharged should be similar to that discharged from the Deer Creek and Cottonwood-Wilberg Mines, which:
   1. Meets secondary drinking water quality standards, and
   2. Has not had identifiable detrimental impacts on the quality of water in the receiving streams

c. flooding or streamflow alteration;

i. Expected discharge, although impossible to predict, will probably be much less than the maximum runoff during spring snowmelt or summer thundershowers;
ii. Flooding and streamflow alteration are not expected from mine discharge waters.

d. ground-water and surface-water availability;

i. Mining will not significantly affect availability of ground water
   1. Ground water in the Blackhawk is compartmentalized and the formation is not a hydraulically continuous aquifer
   2. Ground water in the Blackhawk is isolated from overlying, modern ground waters;
   3. Local effects of dewatering will have no effects on the ground-water availability in the surrounding region.
ii. No water supplies will be impacted by removal of water from strata immediately above and below the coal seams.

e. *other characteristics as required by the Division;* The Division has required the evaluation of no other characteristics.

4. *Whether the UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES conducted after October 24, 1992 may result in contamination, diminution or interruption of State-appropriated Water in existence within the*

proposed permit or adjacent areas at the time the application is submitted.

a. There are no ground-water supply wells in the Mill Fork Lease area.
b. No water supplies will be impacted by removal of water from strata immediately above and below the coal seams.

Findings:

Hydrologic Resource Information is not considered adequate to meet the requirements of this section. Prior to approval the Applicant must provide the following information for the Mill Fork Lease PAP in accordance with:

R654-301-724.100, -121, Ground-water baseline data in the Mill Fork Lease PAP are not sufficient to establish seasonal quality and quantity of ground water. The Coal Mining Rules are clear that the Mill Fork Lease PAP should be complete and contain the required information and not require a search for information at other sources. Of the sites proposed for operational monitoring, EM-216, RR-5, and MF-19B have had only field parameters measured during the baseline monitoring period, and no site has had water quality determined by lab analyses for more than 2 quarters. Data from 4th quarter 2001 need to be included in the PAP.

R654-301-724.100, -121, Ten springs with water rights (Mill Fork Lease PAP Table MFHT-2) are not being proposed for monitoring, and eight of the springs with water rights have no baseline data. Water rights indicate some person has an interest in the quality and quantity of the water and the potential of impacts to that spring from mining. Clarify why these springs do not have baseline and why they will not be monitored.

R654-301-724.100, -121, Data from 1980, 1981, 1982, 1991, 1992, 1993, 1994, 1995, and 1996 in the R645-301-700 Hydrology - Tables do not identify the date, the month, the quarter, or the season they were collected, who collected the data, or for what reason they were collected; they are not effective in determining seasonal variations of quality and quantity. Some of these data are briefly discussed on pages 22 and 23, but the connection between the R645-301-700 Hydrology - Tables and pre-lease hydrology evaluation for the USFS by Genwal is not clear. Clarify the source of these data and Energy West's evaluation of the quality of these data.

R645-301-724.200, -121.100, Baseline data or data summaries for Mill Fork and Indian Creek in the Mill Fork Lease PAP do not provide adequate information on seasonal variation of quality and quantity and are incomplete and inadequate, so current information as required by the Coal Mining Rules is not available in the PAP. The Coal Mining Rules are clear that the Mill Fork Lease PAP should be complete and contain the required information, and not require a search for the

information at other sources, such as annual or quarterly reports. All surface-water baseline data need to be included as part of the Mill Fork Lease PAP before the permit can be approved.

R645-301-121.200, Volume 12 of the Mill Fork Lease PAP contains laboratory reports for 42 seeps and springs from the 3rd and 4th quarter 2000, and for 50 seeps and springs from the 2nd and 3rd quarter 2001. **1)** Indian Creek Above, Indian Creek Below, Indian Creek Canal, and EM Pond that are included with these seep and spring analyses are surface-water monitoring sites. **2)** Indian Creek Ditch (ICD) is described on page 66: it isn't clear whether ICD and Indian Creek Canal are the same site. These two items need to be clarified.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Applicable cross sections and maps included in or referenced in the Mill Fork Lease PAP have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer or land surveyor, with assistance from experts in related fields such as hydrology, geology, and biology (R645-301-513, p. 5-2).

Analysis:

Monitoring Sampling Location Maps

Elevations and locations of monitoring stations used to gather data on water quality and quantity are on Plate 1; Drawing MFS1830D – Hydrologic Map; and Drawing MFS1839D - Pre-subsidence Survey Map.

Subsurface Water Resource Maps

There are no maps showing location and extent of subsurface water, if encountered, within the proposed permit or adjacent areas, including, but not limited to, areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross sections and contour maps.

Although some consider the Blackhawk and Star Point strata to be a regional aquifer, water intercepted in the mine workings is usually encountered in perched aquifers, tabular or stream channel sandstones that have moderate porosity but low permeability and poor interconnectivity. Water is also encountered in open joint-systems in these rocks, and in some instances in fault zones (Roan Canyon fault zone) and synclines (Straight Canyon syncline) (R645-301-624, p. 6-18).

Surface Water Resource Maps

There are no known water-supply intakes for current users of surface waters flowing into, out of, and within the Mill Fork Lease hydrologic area. The water supply system in Rilda canyon is shown on maps and drawings in the existing MRP. No surface waters will receive discharges from affected areas in the proposed Mill Fork Lease area. Locations for Deer Creek Mine UPDES discharge points are shown on maps in the existing MRP. Locations of surface water bodies within the proposed Mill Fork Lease permit and adjacent areas are shown on several maps, including Plate 1; Drawing MFS1830D – Hydrologic Map; and Drawing MFS1839D - Pre-subsidence Survey Map .

Well Maps

Locations of a gas well and a proposed gas well are shown on several maps, including the two Mine Plans, Drawings MFU1840D and MFU1841D, and the Pre-subsidence Survey Map, Drawing MFS1839D.

Findings:

Maps, plans, and cross sections of resource information are considered adequate to meet the requirements of this section.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

Appendix A of the Mill Fork Lease Extension to the Deer Creek Mine PAP is an update of the monitoring plan in Volume 9 of the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg PAP. Appendix B is a report by Mayo and Associates, "Surface-water and ground-water investigation of the Mill Fork Lease area, Emery County, Utah ", for the Mill Fork Lease, which includes a PHC determination.

Appendix C to the Mill Fork Lease Extension to the Deer Creek Mine PAP has been submitted with information on springs and seeps in the Mill Fork Lease. There is an interesting

section with photos and descriptions of the sites; details on location and elevation, geology and stratigraphic position, and water rights and development information; relationships to other springs; and a determination of the probable recharge area. This appendix also contains data report sheets for select seeps and springs – including isotope data for select springs, and water rights in the Mill Fork Lease area.

Ground-water monitoring

R645-301-700 – Hydrology - Appendix A of the Mill Fork Lease PAP lists sampling sites and a monitoring schedule.

Surface-water monitoring

R645-301-700 – Hydrology - Appendix A of the Mill Fork Lease PAP lists sampling sites and a monitoring schedule.

Acid and toxic-forming materials

Extensive testing of overburden strata, coal, and surrounding rocks has shown that there are no potentially acid- and toxic-forming materials (R645-301-623.100). Details of yearly analyses (1993 to 1999) of coal, floor, and roof are in R645-301-600-Geology - Appendix C of the Mill Fork Lease PAP. Analyses of overburden material are presented in Table G-1 in Volume 8 of the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP, and summarized in Appendix A of the Mill Fork Lease PAP.

Transfer of wells

The PAP contains no information on transfer of wells; however, there are no water-monitoring wells, piezometers, or unplugged exploration holes in the Mill Fork Lease area.

Discharges into an underground mine

There are no mine openings in the Mill Fork Lease area. The only potential mine opening associated with this permit extension is possible ventilation breakout in Crandall Canyon, upstream of the existing Crandall Canyon Mine. The need for these portals will be evaluated and the design will be made based on future coal exploration. If these portals are needed, they will be permitted in a separate application. All currently planned coal mine operations in the Mill Fork Lease will be underground.

Gravity discharges

There are no mine openings in the Mill Fork Lease area. The only potential mine opening associated with this permit extension is the possible ventilation breakout in Crandall

Canyon, upstream of the existing Crandall Canyon Mine. The need for these portals will be evaluated and the design will be made based on future coal exploration. If these portals are needed, they will be permitted in a separate application. All currently planned coal mine operations in the Mill Fork Lease will be underground.

Water quality standards and effluent limitations

Discharges of water from areas disturbed by coal mining and reclamation operations will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434 (R645-301-751, p. 7-101). UPDES information is in Appendix B of Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP Volume 9.

Diversions

No diversions are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should not impact existing diversions in the permit and adjacent areas.

Stream buffer zones

No coal mining operations are planned within 100 feet of a perennial or intermittent stream in the Mill Fork Lease. The Applicant states that no such activity will occur without approval from the Division (R645-301-731.600, p. [7-]100).

Sediment control measures

Sediment control facilities at the Deer Creek Mine are discussed in Volume 2, Part 3 of the Deer Creek MRP. No surface facilities, sediment control, or other disturbance is planned in the Mill Fork Lease area.

Siltation structures.

No siltation structures are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should not impact existing siltation structures in the permit and adjacent areas.

Sedimentation ponds.

No sedimentation pond is planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should not impact existing sedimentation ponds in the permit and adjacent areas.

Other treatment facilities

No treatment facilities are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should have no impact on existing treatment structures in the permit and adjacent areas.

Exemptions for siltation structures

There is no request for exemption for siltation structures. No siltation structures are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should have no impact on existing siltation structures in the permit and adjacent areas.

Discharge structures

No discharge structures are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should have no impact on existing discharge structures in the permit and adjacent areas.

Impoundments

No impoundments are planned for the Mill Fork Lease area. Coal mining operations in the Mill Fork Lease should have no impact on existing structures in the permit and adjacent areas.

Ponds, Impoundments, Banks, Dams, and Embankments

No ponds, impoundments, banks, dams, or embankments are planned for the Mill Fork Lease area. Coal mining operations in the Mill Fork Lease should have no impact on existing structures in the permit and adjacent areas.

Casing and sealing of wells

Each coal exploration bore hole will be plugged by filling it from total depth to the surface with type II portland cement, or if that is not feasible, with bentonite chips to within five feet of the surface with cement plug in the top of the hole. A brass marker with the hole number and year will be placed on top of the cement, two feet below surface grade. This method has been approved by the BLM and the Division and has been used in the past to prevent acid and toxic drainage from entering water resources, minimize disturbance to fish, livestock, and wildlife, machinery in the permit and adjacent area. If an exploration borehole is converted to a water monitoring well, Utah water well regulations and the provisions of R645-301-731 will be followed (R645-301-631 and -642, p. 6-23 and 6-24, 6-25 and 6-26).

Findings:

Operation plan hydrologic information in the current Deer Creek Mine MRP provides information that is adequate to meet the requirements of the Coal Mining Rules for the Mill Fork Lease.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Applicable cross sections and maps included in or referenced in the Mill Fork Lease PAP have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer or land surveyor, with assistance from experts in related fields such as hydrology, geology, and biology (R645-301-513, p. 5-2).

There are no impounding structures associated with the Mill Fork Lease PAP.

Analysis:

Mining facilities maps

The only potential surface facility associated with this permit extension is the possible ventilation breakout in Crandall Canyon, upstream of the existing Crandall Canyon Mine. The location for these portals is shown on Drawing # MFU1841D in Section 500 of the Mill Fork Lease PAP. These locations are preliminary, and the need for the portals will be evaluated and the design will be made based on future coal exploration. If these portals are needed, they will be permitted in a separate application (R645-301-623.200). All currently planned coal mine operations in the Mill Fork Lease will be underground.

Monitoring and sample location maps

Elevations and locations of monitoring stations used to gather data on water quality and quantity are on Plate 1; Drawing MFS1830D – Hydrologic Map; and Drawing MFS1839D - Pre-subsidence Survey Map.

Findings:

Maps, plans, and cross sections of operations information for the Mill Fork Lease are considered adequate to meet the requirements of the Coal Mining Rules.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

General

There will be no surface disturbance in the Mill Fork Lease area. There will probably be no disturbance to the hydrologic balance within the permit and adjacent areas other than water removed with the coal, water lost with mine ventilation, and water discharged under the UPDES permits: these are minimal and unavoidable effects. There is no anticipation of acid or toxic drainage. Structures in place will prevent, to the extent possible, additional contributions of suspended solids to streamflow. There is no need foreseen for additional water treatment facilities or drainage control in the Mill Fork Lease area. There have been no potential adverse hydrologic consequences identified in the PHC determination.

There are no permanent or temporary structures, stream channel diversions, and other diversions to be constructed, and there will be no need for postmining removal, reclaiming, or rehabilitation of all structures, sedimentation ponds, diversions, impoundments, and treatment facilities within the Mill Fork Lease area.

Ground-water monitoring

R645-301-700 – Hydrology - Appendix A of the Mill Fork Lease PAP lists sampling sites and a monitoring schedule.

Surface-water monitoring

R645-301-700 – Hydrology - Appendix A of the Mill Fork Lease PAP lists sampling sites and a monitoring schedule.

Acid and toxic-forming materials

Extensive testing of overburden strata, coal, and surrounding rocks has shown that there are no potentially acid- and toxic-forming materials (R645-301-623.100). Details of yearly analyses (1993 to 1999) of coal, floor, and roof are in R645-301-600-Geology - Appendix C of the Mill Fork Lease PAP. Analyses of overburden material are presented in Table G-1 in Volume 8 of the Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP, and summarized in Appendix A of the Mill Fork Lease PAP.

Transfer of wells

The PAP contains no information on transfer of wells; however, there are no water-monitoring wells, piezometers, or unplugged exploration holes in the Mill Fork Lease area.

Discharges into an underground mine

There are no mine openings in the Mill Fork Lease area. The only potential mine opening associated with this permit extension is possible ventilation breakout in Crandall Canyon, upstream of the existing Crandall Canyon Mine. The need for these portals will be evaluated and the design will be made based on future coal exploration. If these portals are needed, they will be permitted in a separate application. All currently planned coal mine operations in the Mill Fork Lease will be underground.

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Water quality standards and effluent limitations

Discharges of water from areas disturbed by coal mining and reclamation operations will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434 (R645-301-751, p. 7-101). UPDES information is in Appendix B of

Deer Creek, Des-Bee-Dove, Cottonwood-Wilberg MRP Volume 9.

Diversions

There are no diversions in the Mill Fork Lease.

Stream buffer zones

No coal mining operations are planned within 100 feet of a perennial or intermittent stream in the Mill Fork Lease. The Applicant states that no such activity will occur without approval from the Division (R645-301-731.600, p. [7-]100).

Sediment control measures

Sediment control facilities at the Deer Creek Mine are discussed in Volume 2, Part 3 of the Deer Creek MRP. No surface facilities, sediment control, or other disturbance is planned in the Mill Fork Lease area.

Siltation structures

No siltation structures are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should not impact existing siltation structures in the permit and adjacent areas.

Sedimentation ponds

No sedimentation pond is planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should not impact existing sedimentation ponds in the permit and adjacent areas.

Other treatment facilities

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Exemptions for siltation structures

There is no request for exemption for siltation structures. No siltation structures are planned for coal mining operations the Mill Fork Lease Coal mining operations in the Mill Fork Lease should have no impact on existing siltation structures in the permit and adjacent areas.

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No impoundments are planned for the Mill Fork Lease area. Coal mining operations in the Mill Fork Lease should have no impact on existing structures in the permit and adjacent areas.

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Casing and sealing of wells

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Findings:

Reclamation plan hydrologic information in the Mill Fork Lease Extension PAP provides information that is adequate to meet the requirements of the Coal Mining Rules.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Reclamation monitoring and sampling location maps

Elevations and locations of monitoring stations used to gather data on water quality and quantity are on Plate 1; Drawing MFS1830D – Hydrologic Map; and Drawing MFS1839D - Pre-subsidence Survey Map.

Findings:

Maps, plans, and cross sections of reclamation operations for the Mill Fork Lease are considered adequate to meet the requirements of the Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

This application for the Mill Fork Lease Extension is being reviewed by the Division to determine whether a new or updated CHIA shall be required. If needed, the Division will provide a revised CHIA of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area.

Findings:

At this time, the Division does not find a need for a new or revised CHIA for the Mill Fork Lease Extension of the Deer Creek Mine PAP.

RECOMMENDATION:

Prior to approval, the requirements of R645-301-700 must be provided as outlined above.